Docket No.: S3-03P07671

MAIL STOP: APPEAL BRIEF-PATENTS

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Before the Board of Patent Appeals and Interferences

Applic. No.	:	10/564,028	Confirmation No.: 4067
Inventor	:	Wolfgang Gottmann, et al.	
Filed	:	May 2, 2006	
Title	:	Circuit Arrangement for EMC Interference Suppression for a Direct Current Motor and a Switching Module	
TC/A.U.	:	2834	
Examiner	:	Tran N. Nguyen	
Customer No.	:	24131	

Hon. Commissioner for Patents

Alexandria, VA 22313-1450

BRIEF ON APPEAL

S i r :

This is an appeal from the final rejection in the Office action dated June 27, 2007, finally rejecting claims 11 - 23.

Appellants submit this *Brief on Appeal* in triplicate, including payment in the amount of $500.00 to cover the fee for filing the *Brief on Appeal*.

Real Party in Interest:

This application is assigned to Siemens Aktiengesellschaft of Germany. The assignment will be submitted for recordation upon the termination of this appeal.

Related Appeals and Interferences:

No related appeals or interference proceedings are currently pending which would directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

Status of Claims:

Claims 11 - 23 are rejected and are under appeal.

Status of Amendments:

No Claims were amended after the final Office action.

Summary of the Claimed Subject Matter:

Independent claim 11 defines a circuit configuration for electromagnetic interference suppression for a direct current motor 2. All of the references to page numbers in this section are made to the translated specification. The direct current motor 2 is described at page 4, line 20 through page 5, line 12 with reference to Fig. 1. The supply line 4, the printed circuit 6, and the control circuit for controlling at least a speed or a torque of the direct current motor 2 are described at page 5, lines 24-31 with reference to Fig. 1. Additional disclosure related to the control circuit is found at page 7, lines 6-9. Page 6, lines 1-20 and Fig. 2 disclose that the

attenuation element 7 is connected in the supply line 4 of the direct current motor 2. Page 6, lines 21-25 disclose that the attenuation element 7 is configured to attenuate electromagnetic interference signals generated in the direct current motor 2. Page 6, lines 4-8, disclose that the attenuation element 7 contains a ferrite material. Page 6, line 21 through page 7, line 9 and Fig. 2 disclose that the attenuation element 7 is disposed on the printed circuit 6 together with the control circuit for controlling the direct current motor 2.

Claim 14 further limits claim 11. Page 7, lines 1-6 disclose that the direct current motor 2 has a housing 5, and that the attenuation element 7 is disposed in the housing 5 of the direct current motor 2.

Independent claim 23 defines a switching module 10, which is described at page 7, lines 1-13 and shown in Fig. 2. The direct current motor 2 is described at page 4, line 20 through page 5, line 12 with reference to Fig. 1. Page 7, lines 1-6 disclose that the printed circuit 6 (PCB) is connected to the direct current motor 2. Page 6, line 21 through page 7, line 9 and Fig. 2 disclose that the printed circuit 6 contains a control circuit for controlling the direct current motor 2 and an attenuation element 7 connected in a supply line 4 of the direct current motor 2. Page 6, lines 2-6 and Fig. 2 disclose that the attenuation element has a common mode ferrite 9. Page 6, lines 25-29 disclose that the common mode ferrite 9 is disposed on the printed circuit 6 as close as possible to or in the direct current motor 2 (also see page 3, lines 3-8). Page 7, lines 1-9 and Fig. 2 disclose a common housing 5 enclosing the printed circuit 6, the attenuation element 7, and the direct current motor 2.

References Cited:

US 2003/0001448	Kaeufl et al.	January 2, 2003
US 5,896,079	Parker	April 20, 1999
US 6,232,684	Haag et al.	May 15, 2001

Grounds of Rejection to be Reviewed on Appeal

1. Whether or not claims 11 - 23 are obvious over Kaeufl et al. (US Pub 2003/0001448) in view of Parker (US 5,896,079) and Haag et al. (US 6,232,684) under 35 U.S.C. § 103.

Argument:

Claims 11 - 23 are not obvious over Kaeufl et al. in view of Parker and Haag et al. under 35 U.S.C. § 103

Claims 11 and 23 are not obvious

Independent claim 11 defines a circuit configuration including, inter alia, an attenuation element connected in the supply line of a direct current motor. The attenuation element is configured to attenuate electromagnetic interference signals generated in the direct current motor. Importantly, the attenuation element contains a ferrite material.

Independent claim 23 defines a switching module in which an attenuation element is connected in the supply line of a direct current motor. The attenuation element is a common mode ferrite.

Kaeufl et al. teach an electric drive unit including a direct current electric motor 10 for operating an automobile window (See paragraph 0013). Interference suppression components 23 are connected in the supply line of the electric motor 10. Kaeufl et al. teach that the suppression components 23 can be, for example, capacitors for preventing external interfering influences, such as EMC incident radiation (see paragraph 0015).

Importantly, Kaeufl et al. teach that the electric motor draws a nominal power of 200 Watts (See paragraph 0014, lines 1-3). Since the electric motor 10 is used in an automobile we can assume that the voltage supply is 12 Volts. That would result in the electric motor 10 drawing a nominal current of 16.67 Amperes (200W/12V). Kaeufl et al. also teach that currents of up to 20 Amperes can arise (See paragraph 0015, fourth line before the last line).

Parker teaches a common mode RF bead including a ferrite body 40. Parker teaches that the impedance increases steadily from 1 Megahertz to 700-800 Megahertz. The impedance reaches 700 Ohms at 300 Megahertz and remains above 300 Ohms up to 1 Gigahertz (See column 4, lines 3-19). Referring to Fig. 3, one can see that the impedance is about 175 Ohms at 100 Megahertz and that the impedance has not quite reached 50 ohms at 10 Megahertz. Parker teaches that

the advantage of their bead is that it has an increased frequency range or bandwidth (See column 2, lines 39-42 and column 4, lines 16-19).

Appellants believe that it would not have been obvious to replace the capacitors (suppression components 23) of the electric drive unit taught by Kaeufl et al. with the RF bead taught by Parker.

First, appellants believe that one of ordinary skill in the art would not have made the substitution because it was know that a ferrite, such as the RF bead taught by Parker, could not handle the current drawn by the electric motor.

Kaeufl et al. teach that the electric motor 10 draws a nominal current of 16.67 Amperes and perhaps a current of 20 Amperes. Appellants refer to page 2, lines 2-7 of the specification of their own application where they disclose that known attenuation elements, which are constructed as ferrites, are only provided for use in computer and data lines and can only transmit a direct current limited to several amperes. Appellants believe it was well known that the RF bead taught by Parker would simply burn out if placed in the electric motor supply lines and therefore such a substitution would not have been obvious.

Second, appellants believe that the reason provided by the Examiner to make the substitution would not have motivated one of ordinary skill in the art to do so. The Examiner has apparently alleged that the reason for making the modification would be to take advantage of the very high resistance range and the very wide frequency range of the bead taught by Parker.

Appellants believe that the frequency range at which the RF bead of Parker has a meaningful attenuation is simply too high when compared to the frequency ranges of interest with a DC motor. Appellants refer to Fig 4 and to page 8, lines 8-31 of their own application where it is disclosed that two high frequency ranges are of interest when dealing with EMC caused by DC motors. The ranges are from approximately 6 Megahertz to less than 20 Megahertz and from approximately 25 to 120 Megahertz. The RF bead taught by Parker has an impedance of 175 Ohms at 100 Megahertz, 700 Ohms at 300 Megahertz, and remains above 300 Ohms up to 1 Gigahertz. Appellants believe it should be clear that the useful attenuation range of the RF bead only begins near the higher end of the higher range of concern when dealing with DC motors, and that therefore, one of ordinary skill in the art would not have been motivated to use the RF bead with a DC motor.

Claim 14 is not obvious

Claim 14 depends from claim 11. Claim 14 additionally limits the invention by specifying that the attenuation element is disposed in the housing of the direct current motor.

Hang et al. teach an electric motor 34 having a housing formed as a metal motor casing 136 (See column 6, lines 23-35 and Fig. 1). The electric motor 34 and the electronic filter 72 are disposed in a clamshell housing 22 (See column 2, lines 55-56, column 4, lines 11-15 and Fig. 1).

The Examiner has alleged that Hang et al. teach a common housing (clamshell housing 22) and that it would have been obvious to have incorporated the modified electric drive unit of Kaeufl et al. into the common housing taught by Hang et al.

Even if one were to accept the allegations of the Examiner, appellants point out that Hang et al. do not teach disposing the electronic filter 72 in the housing of the motor (metal motor casing 136). Even if the asserted modification were made, the invention defined by claim 14 would not have been obtained. Appellants believe that one of ordinary skill in the art considering the references could not have been motivated to place an attenuation element in the housing of a direct current motor as required by claim 14.

The honorable Board is therefore respectfully urged to reverse the final rejection of the Primary Examiner.

Respectfully submitted,

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Claims Appendix:

1-10 (canceled).

11. A circuit configuration for electromagnetic interference suppression for a direct current motor, the direct current motor having a supply line and a printed circuit with a control circuit for controlling at least a speed or a torque of the direct current motor, the circuit configuration comprising:

an attenuation element connected in the supply line of the direct current motor, said attenuation element being configured to attenuate electromagnetic interference signals generated in the direct current motor, containing a ferrite material, and being disposed on the printed circuit together with the control circuit for controlling the direct current motor.

12. The circuit configuration according to claim 11, wherein said attenuation element is a common mode ferrite.

13. The circuit configuration according to claim 11, wherein the direct current motor has a housing, and said attenuation element is disposed as close as possible to said housing of the direct current motor.

14. The circuit configuration according to claim 11, wherein the direct current motor has a housing, and said attenuation element is disposed in said housing of the direct current motor.

15. The circuit configuration according to claims 11, wherein the printed circuit with said attenuation element and the direct current motor are disposed in a common housing suitable for use as a switching module.

16. The circuit configuration according to claim 15, wherein said attenuation element is configured to attenuate interference signals due to sparking at a commutator of the direct current motor.

17. The circuit configuration according to claim 11, wherein said attenuation element is a surface mounted device circuit.

18. The circuit configuration according to claim 17, wherein said attenuation element is configured to attenuate interference signals due to sparking at a commutator of the direct current motor.

19. The circuit configuration according to claim 11, wherein said printed circuit is configured for later insertion of said attenuation element.

20. The circuit configuration according to claim 19, wherein said attenuation element is configured to attenuate interference signals due to sparking at a commutator of the direct current motor.

21. The circuit configuration according to claim 11, wherein the direct current motor is configured to drive an auxiliary assembly for a motor vehicle.

22. The circuit configuration according to claim 11, wherein the direct current motor is a drive motor of an assembly selected from the group of a transmission control, windshield wipers, a window closing system, and a seat adjuster.

23. A switching module, comprising:

a direct current motor;

a printed circuit connected to said direct current motor, said printed circuit containing a control circuit for controlling said direct current motor and an attenuation element connected in a supply line of said direct current motor;

said attenuation element having a common mode ferrite and being disposed on said printed circuit as close as possible to or in said direct current motor; and

a common housing enclosing said printed circuit, said attenuation element, and said direct current motor.

Evidence Appendix:

No evidence pursuant to && 1.130, 1.131, or 1.132 or any other evidence has been entered by the Examiner and relied upon by appellant in the appeal.

Related Proceedings Appendix:

No prior or pending appeals, interferences or judicial proceedings are in existence which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in this appeal. Accordingly, no copies of decisions rendered by a court or the Board are available.